



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,972	09/10/2003	Ralf Beck	00655-1215US	3989

32116 7590 08/11/2004

WOOD, PHILLIPS, KATZ, CLARK & MORTIMER
500 W. MADISON STREET
SUITE 3800
CHICAGO, IL 60661

EXAMINER

DUONG, THO V

ART UNIT PAPER NUMBER

3743

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/658,972

Applicant(s)

BECK ET AL.

Examiner

Tho v Duong

Art Unit

3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Election/Restrictions***

Claim 8 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected non-elected species, there being no allowable generic or linking claim. Election of species of figure 6 was made **without** traverse in the reply filed on 7/15/2004. The examiner further withdrew claim 6 since the subject matter that the tube walls being deformed along their length between the inlet and outlet headers to define separate coolant passage is not directed to the elected species of figure 6, which has an insert (94) forming separated coolant passages.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2,3,5,7,9 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyerhofer (US 4,791,982) in view of Kato (US 5,697,433). Meyerhofer discloses (figures 1,3) a downdraft radiator (7) comprising an inlet header (3); an outlet header (4); a core having a plurality of coolant flat tubes (10) joining the inlet and outlet headers, cooling fins (12) on opposite sides of the coolant flat tubes; a first and second multifunction flat tube (11) disposed one two sides of the core and between the inlet and outlet headers (3,4) to carry coolant between two headers; and the multifunction flat tubes (11) have a greater section modulus (cross section) than the coolant flat tubes (10) so that an inner flow resistance of the multifunctional flat tube is

Art Unit: 3743

smaller than the inner flow resistance of the coolant flat tube; and the inlet and outlet headers have a tube sheet (5) that includes a plurality of openings for receiving larger tubes (11) and a plurality of smaller openings for receiving smaller tubes (10). Meyerhofer is silent about how each of the heat exchanger components are joined together and an insert within the tube to defined coolant passages. Kato discloses (figures 1,12 and 13) a heat exchanger having a plurality of flat tubes (2) wherein the heat exchanger uses brazing method (one form of soldering or welding) for the purpose of joining all of the heat exchanger components such as fins, tubes and headers together. Meyerhofer further discloses (figure 13 and column 7, lines 21-54) that each flat tube (2) of the heat exchanger is formed by brazing and an insert (18) is disposed within the flat tube for the purpose of enhancing the heat exchange efficiency as well as the strength of the flat surface of the tube. Since Meyerhofer and Kato are both from the same field of endeavor and/or analogous art, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ Kato's teaching in Meyerhofer's heat exchanger for the purposing of joining the heat exchangers together and for enhancing the heat exchange efficiency as well as the strength of the flat surface of the tube.

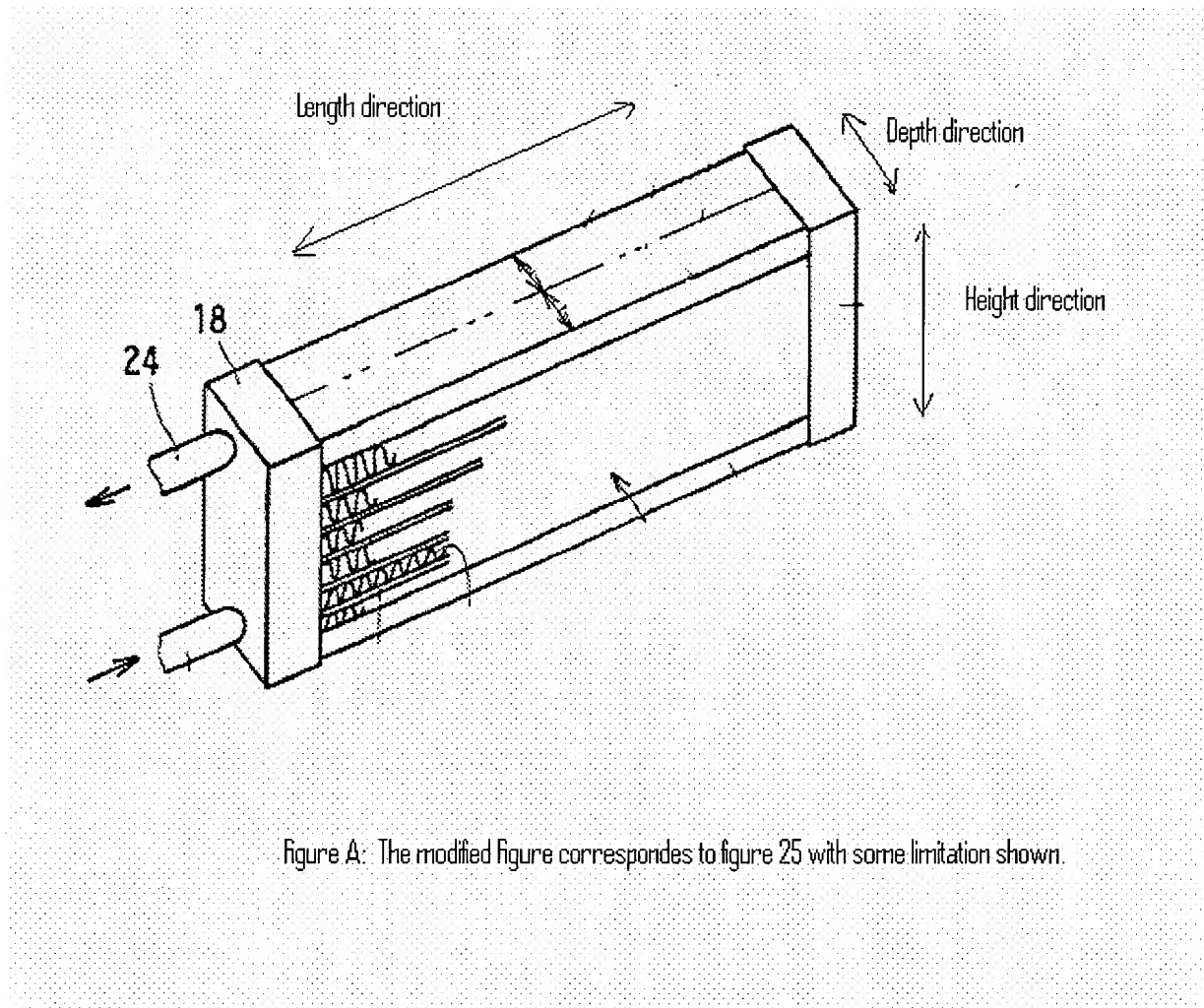
Claims 1-4 and 9-19 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fukuoka (US 6,341,648). Fukuoka discloses (figures 10 and 25-26) a heat exchanger comprising an inlet/outlet header (18) and an inlet/outlet header (17) since each header has a function of receiving and delivering a fluid; a brazed core (110,111) having a plurality of coolant flat tubes (11a) joining the inlet header and outlet header; cooling fins (11b) on opposite sides of the coolant flat tubes; a first and second multifunction flat tubes (50,51) having a greater section modulus in cross section so that an inner flow resistance of

Art Unit: 3743

the multifunctional flat tube (50,51) is smaller than the inner flow resistance of the coolant flat tube (11); the multifunctional flat tube (50,51) has substantially the same length and depth as the core (See figures 25,26). As regarding claims 15 and 19, Fukuoka discloses (figures 10 and 26) that the heat exchanger can also be oriented vertically so that the flat tubes extend generally vertically with the inlet/outlet header; a partition (20) defined first and second chamber (18a,18b), which are all above the multifunction flat tubes and the coolant flat tubes; a filling line (22) between a coolant fill supply (a source of coolant) and the first chamber for adding coolant to the heat exchanger, wherein the filling line slopes down from the coolant fill supply to the first chamber. As regarding claim 10, Fukuoka discloses (figures 24-26 and Figure A as bellow) that the multifunction flat tubes (50,51) have a wall thickness substantially greater than the wall thickness of the coolant flat tubes and a tube height substantially greater than the height of the coolant flat tube. As regarding claims 11 and 13, basing on the geometrical relationship between the multifunction tube (50,51) and coolant tubes (11a) as shown in figures 24 and 25, the thickness and the height of the tubes (50,51) are at least two times the wall thickness and the height of the tubes (11) respectively. Fukuoka does not disclose that the tube wall (50,51) has a thickness and a height of at least 1.0 mm and 10 mm respectively. It would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain the thickness and height of the multifunction flat tube of at least 1mm and 10 mm respectively, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routinely skill in the art. In re Aller, 105 USPQ 233. Furthermore, applicant does not disclose that the claimed range such as at least 1 mm, 10 mm, at least twice the thickness and at least twice the height would solve any stated problem or any

Art Unit: 3743

criticality of the range. Moreover, it appears that the heat exchanger would perform equally well with the thickness and height as shown by the prior art. Accordingly, the claimed thickness and height range is deemed to be a design consideration, which fails to patentably distinguish over the prior art of Fukuoka.



Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 3743

Aoki et al. (US 5,101,890) discloses a heat exchanger that has a larger tube on one side of the heat exchanger core.

F. A. Hiersch (US 3,034,770) discloses a heat exchanger with larger cross section flow pass on outer edge.

Halstead (US 5,186,248) discloses an extruded tank that has larger tube and tank manifold.

Arold et al. (US 4,771,942) discloses a vehicle cross flow heat exchanger.

Kado (US 5,236,042) discloses a heat exchanger that has larger tube one a side of a heat exchanger core.

Cheong (US 4,098,328) discloses a cross flow radiator that has a slopped inlet line.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tho Duong whose telephone number is (703) 305-0768. The examiner can normally be reached on from 9:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet, can be reached on (703) 308-0101. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.

TD

TD

August 7, 2004



Tho Duong

Patent Examiner.